

Serial No. 09/939,707

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions and listings of claims in the application:

1-29. (Canceled)

30. (Currently Amended) The method according to one of claims 25 or 26, A method for data maintenance in an offline-distributed database network system, the database network system comprising a central system having a central database, and a plurality of node systems having local databases, the local databases capable of containing different subsets of data from the central database, the method comprising: recording change information relating to data stored in at least one of the central and local databases in the database network system in at least one of the plurality of node systems;

transmitting a replication object including the change information, if an online connection is available, from said at least one of the node systems to the central system or from the central system to said at least one of the node systems, the recipients of the replication object being determined based on at least one lookup table in the central system; and

updating said at least one lookup table in accordance with the change information of the replication object.

wherein said at least one lookup table includes a first-type lookup table and a second-type lookup table, the first-type lookup table containing an allocation between types of structure of replication objects and responsible node systems, the second-type lookup table containing an allocation between entities of replication objects and

Serial No. 09/939,707

responsible node systems, the responsible node systems being responsible for the replication object in the database network system.

31. (Previously Presented) The method according to claim 30, wherein said at least one lookup table further includes a plurality of lookup tables of the second type, each of the plurality of second-type lookup tables containing an allocation between the entities of one of the different types of structure and responsible node systems.

32. (Previously Presented) The method according to claim 30, further comprising:

determining, in a replication algorithm, responsible node systems for the replication object,

and wherein the replication algorithm is carried out by at least one of first and second replication algorithms depending on the type of structure of the replication object, the first replication algorithm being used to allocate a first subset of the replication object to the responsible node systems as a function of the type of structure of the replication object, using the first-type lookup table, and the second replication algorithm being used to allocate a second subset other than the first subset of the replication object to the responsible node systems as a function of an entity of the replication object, using the second-type lookup table.

33. (Previously Presented) The method according to claim 32, wherein the replication algorithm is carried out by a third replication algorithm, the third replication algorithm being used to allocate a third subset other than the first and second subsets of the replication object to the responsible node systems as a function of allocation entered for a higher-level replication object in the second-type lookup table.

Serial No. 09/939,707

34. (Currently Amended) ~~The method according to one of claims 25 or 26,~~
further comprising: A method for data maintenance in an offline-distributed database
network system, the database network system comprising a central system having a
central database, and a plurality of node systems having local databases, the local
databases capable of containing different subsets of data from the central database, the
method comprising:

recording change information relating to data stored in at least one of the central
and local databases in the database network system in at least one of the plurality of
node systems;

transmitting a replication object including the change information, if an online
connection is available, from said at least one of the node systems to the central system
or from the central system to said at least one of the node systems, the recipients of the
replication object being determined based on at least one lookup table in the central
system;

updating said at least one lookup table in accordance with the change
information of the replication object; and

determining, in a replication algorithm, responsible node systems for the
replication object,

wherein the step of updating is carried out in a realignment algorithm
independently of the replication algorithm, and asynchronously with respect to the
replication algorithm.

35. (Currently Amended) ~~The method according to claim 27, further comprising:~~
A method for data maintenance in an offline-distributed database network system, the

Serial No. 09/939,707

database network system comprising a central system having a central database, and a plurality of node systems having local databases, the local databases capable of containing different subsets of data from the central database, the method comprising: recording change information relating to data stored in at least one of the central and local databases in the database network system in at least one of the plurality of node systems;

transmitting a replication object including the change information, if an online connection is available, from said at least one of the node systems to the central system or from the central system to said at least one of the node systems, the recipients of the replication object being determined based on at least one lookup table in the central system;

updating said at least one lookup table in accordance with the change information of the replication object;

determining, in a replication algorithm, responsible node systems for the replication object; and

generating, in the replication algorithm, a job for the step of updating, when the database operation corresponding to the change information included in the replication object is insertion or deletion,

wherein the replication object comprises a type of structure, and a type of database operation corresponding to the change information, the database operation being one of modification, insertion, and deletion.

36. (Currently Amended) ~~The method according to claim 27, further comprising:~~
A method for data maintenance in an offline-distributed database network system, the

Serial No. 09/939,707

database network system comprising a central system having a central database, and a plurality of node systems having local databases, the local databases capable of containing different subsets of data from the central database, the method comprising:
recording change information relating to data stored in at least one of the central and local databases in the database network system in at least one of the plurality of node systems;

transmitting a replication object including the change information, if an online connection is available, from said at least one of the node systems to the central system or from the central system to said at least one of the node systems, the recipients of the replication object being determined based on at least one lookup table in the central system;

updating said at least one lookup table in accordance with the change information of the replication object;

determining, in a replication algorithm, responsible node systems for the replication object; and

generating, in the replication algorithm, a job for the step of updating, when the database operation corresponding to the change information included in the replication object is modification and data in at least one predetermined distribution-critical data field of the replication object have been changed,;

wherein the replication object comprises a type of structure, and a type of database operation corresponding to the change information, the database operation being one of modification, insertion, and deletion.

Serial No. 09/939,707

37. (Previously Presented) The method according to claim 32, further comprising:

checking, in the second replication algorithm, the type of database operation to determine whether or not to generate a job for the step of updating.

38-39. (Canceled)

40. (Currently Amended) The method according to one of claims 25 or 26, A method for data maintenance in an offline-distributed database network system, the database network system comprising a central system having a central database, and a plurality of node systems having local databases, the local databases capable of containing different subsets of data from the central database, the method comprising:
recording change information relating to data stored in at least one of the central and local databases in the database network system in at least one of the plurality of node systems;

transmitting a replication object including the change information, if an online connection is available, from said at least one of the node systems to the central system or from the central system to said at least one of the node systems, the recipients of the replication object being determined based on at least one lookup table in the central system; and

updating said at least one lookup table in accordance with the change information of the replication object, wherein the step of updating includes:

determining up-to-date responsible node systems in accordance with the change information included in the replication object;

Serial No. 09/939,707

comparing said up-to-date responsible node systems with current responsible node systems listed in said at least one lookup table to determine additional responsible node systems and out-of-date responsible node systems; and

providing information on said additional and out-of-date responsible node systems for update of said at least one lookup table.

41. (Previously Presented) The method according to claim 40, wherein the step of updating further includes:

initiating, when said additional and out-of-date responsible node systems have been determined, insert operations for the additional responsible node systems and delete operations for the out-of-date responsible node systems;

transmitting data contents of the replication object to the additional responsible node systems; and

deleting data contents corresponding to the replication object from the local databases of the out-of-date responsible node systems.

42. (Previously Presented) The method according to claim 41, wherein the substep of initiating is performed by an extract algorithm, independently and asynchronously of the other substeps in the step of updating, and the extract algorithm is capable of producing replication objects which are transmitted to the additional responsible node systems in order to carry out the insert operations and to the out-of-date responsible node systems in order to carry out the delete operations.

43. (Previously Presented) The method according to claim 41, wherein the information on said additional and out-of-date responsible node systems is not provided for update of said at least one lookup table until assurance has been obtained that the

Serial No. 09/839,707

insert and delete operations have been carried out, before a changed lookup table is accessed for the first time.

44. (Previously Presented) A method for data maintenance in an offline- distributed database network system, the database network system comprising a central system having a central database, and a plurality of node systems having local databases, the local databases capable of containing different subsets of data from the central database, the method comprising:

recording change information relating to data stored in at least one of the central and local databases in the database network system in at least one of the plurality of node systems;

transmitting a replication object including the change information, if an online connection is available, from said at least one of the node systems to the central system or from the central system to said at least one of the node systems, the recipients of the replication object being determined based on at least one lookup table in the central system; and

updating said at least one lookup table in accordance with the change information of the replication object, wherein replication objects are linked to one another to form a cluster, and the step of updating includes:

determining, in a for-loop, up-to-date responsible node systems in accordance with the change information included in the replication objects belonging to the cluster;

Serial No. 09/939,707

comparing, in the for-loop, said up-to-date responsible node systems with current responsible node systems listed in said at least one lookup table to determine additional responsible node systems and out-of-date responsible node systems; and providing information on said additional and out-of-date responsible node systems for update of said at least one lookup table after completion of the for-loop.

45. (Currently Amended) The method according to ~~one of claims 25 or 26~~claim 46, wherein the replication object is identified by a key assigned uniquely throughout the database network system.

46. (Previously Presented) A computer usable medium having computer readable program codes embodied therein for performing a method for data maintenance in an offline-distributed database network system, the database network system comprising a central system having a central database, and a plurality of node systems having local databases, the local databases capable of containing different subsets of data from the central database, the method comprising:

recording change information relating to data stored in at least one of the central and local databases in the database network system in at least one of the plurality of node systems;

transmitting a replication object including the change information, if an online connection is available, from said at least one of the node systems to the central system or from the central system to said at least one of the node systems, the recipients of the replication object being determined based on at least one lookup table in the central system; and

Serial No. 09/939,707

updating said at least one lookup table in accordance with the change information of the replication object.

47. (Previously Presented) A offline-distributed database network system comprising:

a central system having a central database and capable of executing a replication algorithm and a realignment algorithm; and

a plurality of node systems having local databases, the local databases capable of containing different subsets of data from the central database,

and wherein

at least one of the plurality of node systems records change information relating to data stored in at least one of the central database and local databases;

if an online connection is available, a replication object including the change information is transmitted from said at least one of the node systems to the central system or from the central system to said at least one of the node systems, the recipients of the replication object being determined by the replication algorithm based on at least one lookup table in the central system; and

the realignment algorithm updates said at least one lookup table in accordance with the change information of the replication object.

48. (New) The method according to one of claims 30, 34, 35, 36, 40, or 44, wherein the replication object comprises data sets which are public among the central database and local databases in the database network system.

49. (New) The method according to claim 48, wherein said at least one lookup table further includes a plurality of lookup tables of the second type, each of the plurality

Serial No. 09/939,707

of second-type lookup tables containing an allocation between the entities of one of the different types of structure and responsible node systems.

50. (New) The method according to claim 48, further comprising:

determining, in a replication algorithm, responsible node systems for the replication object,

and wherein the replication algorithm is carried out by at least one of first and second replication algorithms depending on the type of structure of the replication object, the first replication algorithm being used to allocate a first subset of the replication object to the responsible node systems as a function of the type of structure of the replication object, using the first-type lookup table, and the second replication algorithm being used to allocate a second subset other than the first subset of the replication object to the responsible node systems as a function of an entity of the replication object, using the second-type lookup table.

51. (New) The method according to claim 50, wherein the replication algorithm is carried out by a third replication algorithm, the third replication algorithm being used to allocate a third subset other than the first and second subsets of the replication object to the responsible node systems as a function of allocation entered for a higher-level replication object in the second-type lookup table.